



# BLADES2BUILD PROJECT

## D7.2: Data Management Plan

WP7  
DTU

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Funded by  
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<sup>1</sup>PU – Public, fully open, e.g., web (Deliverables flagged as public will be automatically published in CORDIS project's page)

SEN – Sensitive, limited under the conditions of the Grant Agreement

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## LIST OF ABBREVIATIONS

3D – 3 dimensional

ARK – Archival Resource Key

ASTM – American Standard Testing for Materials

AWS – Amazon Web Services

EC2 – (Amazon) Elastic Compute Cloud

CA – Consortium Agreement

D – Deliverable

DMTA – Dynamic Mechanical Thermal Analysis

DNS – Domain Name System

DoA – Description of the Action

DOI – Digital Object Identifiers

DoW – Description of Work

DSC – Differential Scanning Calorimetry

EC – European Commission

EN – European Norm

EOL – End of Life

EPD – Environmental Product Declaration

ERP – Enterprise resource planning

FAIR – (data) findability, accessibility, interoperability, and reusability

FP – Framework Programme

FTIR – Fourier Transformed Infrared (spectroscopy)

GA – General Agreement

GB – Gigabyte

IPR – Intellectual Property Right

ISBN – International Standard Book Number

ISO – International Organization for Standardisation

ISSN – International Standard Serial Number

ITC – Isothermal Titration Calorimetry

K-hub – Knowledge Hub

LCA – Life Cycle Assessment

LCC – Life Cycle Cost



LCI – Life Cycle Inventory  
LE – Large Enterprises  
M – Month  
MySQL – a RDBMS based on SQL  
PC – Project Coordinator  
PM – Person Month  
PO – Project officer  
PP – Programme Participants  
PTC – Project Technical Committee  
PU – Public (dissemination level)  
QMS – Quality Management System  
RDBMS – Relational Database Management System  
RDS – (Amazon) Relational Database Service  
S3 – Simple Storage Service  
SC – Steering Committee  
SEM – Scanning Electron Microscopy  
SEN – Sensitive (dissemination level)  
SME – Small and Medium Enterprise  
SQL – Structured Query Language  
SQS – Simple Queue Service  
T – Task  
TGA – Thermogravimetric Analysis  
TM – Technical Manager  
TRL – Technological Readiness Level  
VDI – Verein Deutscher Ingenieure  
VPC – Virtual Private Cloud  
WP – Work Package



*The Horizon Europe Model Grant Agreement requires that a data management plan ('DMP') is established and regularly updated. The use of this template is recommended for Horizon Europe beneficiaries. In completing the sections of the template, the requirements for research data management of Horizon Europe as described in article 17 and analysed in the Annotated Grant Agreement, article 17, must be addressed.*

## 1 DATA SUMMARY

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*Will you re-use any existing data and what will you re-use it for? State the reasons if re-use of any existing data has been considered but discarded.*

The project will reuse existing data and combine it with the newly generated dataset. The existing data consists of some previous results provided by the partners related to the lower TRL findings or experimental WPs (1-4) or LCA/LCC analysis outcomes and will be reused for contrasting the evolution of the demonstration.

*What types and formats of data will the project generate or re-use?*

The project will release the following outputs:

- text (reports, roadmap, and policy brief) in \*.docx, \*.pdf formats, \*.pptx,
- numerical datasets in \*xlsx (templates and SUB-RES files) and LCA model files or other metadata formats,
- computing software or data structure and objects interchange in \*.csv, \*.json, \*.pcr, \*.xml, \*.ogs, etc. formats,
- images (namely infographics and video files) in \*.jpeg, \*.bmp, \*.pdf formats, as well as \*.mp4, \*.mpeg-4, \*.mov, \*.wmv, \*.flv, \*.avi, \*.webm, \*.ogg, etc.,
- drawings (AutoCAD) in \*.dwg and/or \*.pdf formats.

On the other hand, two categories of generated and/or re-used outputs will be originated:

- publishable (research articles, communications to conferences, and congresses, provided with gold or green open access), and
- unpublishable (reports, several forms of dissemination and storage through a dedicated knowledge hub, open access libraries, workshops/seminars-derived materials, etc.),

whose dissemination is limited solely by the requirement to exclude the use of confidential or sensitive information (Sections 8.4 and 10 of the CA).

*What is the purpose of the data generation or re-use and its relation to the objectives of the project?*

The project's technical -and non-technical developments at the pre-demonstration and demonstration stages are based on both re-used and generated databases. The gathered information and advances are meant to be represented, if it is not confidential and/or sensitive information, through a platform for engaging the interdisciplinary researchers, integrating scholars from diverse backgrounds and the stakeholders' related professional and general audiences. Together with the publishable contents, the main purpose is to provide and distribute information and awareness for sustainable development in EOL blades' zero-waste circularity aspects as such. The upstream consortium's approach implies fostering synergies between the several EU projects in the consortium partners' network related to the project's outcomes.





Finally, the gathered data resources in this project and their dedicated dissemination and exploitation aim at

- inspiring better policies and influencing the existing ones by providing evidence-based science and innovation,
- practicing and adding value to open-source workflows much more beyond the scientific database,
- promoting innovative and resilient circular solutions for sustainable wind energy activities,
- providing more visible and standardized engineering and management services,
- creating enhanced or new market opportunities and business models under innovative recycling systems.

*What is the expected size of the data that you intend to generate or re-use?*

The respective estimated size of the planned outputs is 1 GB for the databases and up to 10 GB for the graphic results.

*What is the origin/provenance of the data, either generated or re-used?*

The data of this project is produced through 7 WPs: 5 technical (WP1-5) and 2 non-technical ones (WP6-7). Namely,

- WP1 – End-of-life composites characterization,
- WP2 – Testing and Identification of Scalable Circularity Frameworks,
- WP3 – Developing circular construction materials,
- WP4 – Design and Development of a Flexible Production Line,
- WP5 – Demonstration of the on-site flexible pilot,
- WP6 – Knowledge Hub, Dissemination, Communication, and Exploitation,
- WP7 – Management.

The project produces both technical and non-technical data over two types of matrix materials, inorganic (Portland cement-based binders) and organic ones (bituminous asphalts) mainly in WP1-3. The technical data will come from the series of experiments carried out with the following techniques or tools:

- DSC, TGA, FTIR, SEM, Raman, tribology, porosity, conductivity performance, aging properties, flammability properties, mechanical/durability and fractographic performance, pH-dependent leaching tests by EN 14429:2015-5 and gas/liquid chromatographic screening, DMTA, isothermal calorimetry (e.g., ITC), X-ray diffraction, X-ray fluorescence, freeze-thaw, corrosion resistance, shrinkage and cracks formation, fire resistance, and hydrophilic behaviour (contact angle measurements) measurements for the inorganic matrices, durability assessing permanent deformation (rutting), stiffness, and fatigue resistance for the organic matrices, rheology measurements, computed tomography scan, optical or scanning electron microscopy, laboratory leaching tests of by EN 16637-2, EN 16637-3, volatile substances by VDI 2083-17 – WP1 (material development process),
- mortar activity index by EN 450-1, heat flow calorimeter by ASTM C1897-20, aggregates properties by EN 12620, EN 13043 and EN 13055, fibres properties by EN 14889-1,



concrete properties EN 206 and EN 14889-2, X-ray tomography, a 3D model developed by finite element software Abaqus – WP2 (waste treatments),

- mix designs and characterisation through standard properties as cement, ceramics (clays, adobes) by EN 196, etc., masonry element test-based validations – WP3 (products design, characterisation, and upscaling).

Additionally, some technical data will be used under WP4 generated by or collected from the following systems:

- Data embedded in some of the background solutions of industrial partners throughout their ERP systems/cloud servers,
- Raw data (operational data including financial information) that will be used in the illustrative case throughout corresponding ERP systems/cloud servers:
  - Product portfolios, product trees, technical sheets of potential instruments and equipment, operational times, inventory level, etc.,
  - Unit energy, workforce, transportation, inventory holding costs, emission ratios, waste volumes, etc.,
- Some technical drawings including facilities, and machinery parks prepared by CAD systems under WP4 and WP5.

Non-technical meta(data) will be collected from and/or for the following ones:

- Life cycles procedures (LCA by ISO 14040/44, LCI for a database), and the resultant declarations (EPD) – WP3 and WP4,
- Personal data of end users, stakeholders, and policy makers collected and communicated for marketing studies as fully responsive to Sections 3.7, 4.4, 8.4 and 10 of the CA (via individual contacts, mobile calls, institutional and private emails, workshops, F2F meetings, etc.) – WP4,
- Promotional materials for the project's communications and networking (video files for general public published on the project's website and the project's social media accounts with each partner's specific role's spoken and visual contributions) – WP6,
- A knowledge hub software (K-hub) in a form of an interactive and dynamic network platform (a cloud) to capture, share and exchange data and the project's outputs to wider audiences within a 10-year timeline after the project's termination – WP6. The software is originated from the following technologies, namely:
  - Front-end: Angular or React Framework; Backend: Java 19 with Spring Framework; Database: MySQL,
  - As deployed in AWS Cloud the hub will make use of all Managed Services (EC2, S3, SQS, RDS, DNS, Load Balancers, VPC, etc.). All data will be saved in the database and in S3 buckets (saving locations that are related to the format of the file).

*To whom might your data be useful ('data utility'), outside your project?*

The data collection gathered will result in at least 15 presentations to workshops and other national/international events at both public and private sector audiences, at least 2 training short-term schools technology-oriented for students, and at least 6 research publications with open access at competitive sectorial journals.



Data's usefulness will focus scientific community, students in academia, stakeholders' proper networks with policymakers' presence considered, and a general audience. The main objectives for such a utility are a simulation of the consumers' patterns, the proper sector transition, and end-of-waste circularity in terms of commercialization.

**Keywords:** DMP, open science.

## 2 FAIR DATA

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### 2.1 Making data findable, including provisions for metadata

*Will data be identified by a persistent identifier?*

Yes. The Blades2Build-resultant publications and accompanying data will be made openly available upon acceptance and in the function of its type. The project will use all the following persistent digital identifiers: DOI, handles, ISBN, ISSN, and ARK. As expected, the unpublishable contents will not have externally reachable references.

*Will rich metadata be provided to allow discovery? What metadata will be created? What disciplinary or general standards will be followed? In case metadata standards do not exist in your discipline, please outline what type of metadata will be created and how.*

Yes. Firstly, the originated metadata in the project will be protected from dilution or non-categorization by being provided with the existing infrastructure supporting Open Science and FAIR data in terms of information management. Secondly, the main infrastructure of the project will be a creation of a knowledge hub gathering all the essential unpublishable data and metadata. Its principal objective is an efficient and effective network and exchange during the project implementations and afterward.

The generated data feed will be organized into different types of metadata to be created along with the project i.e., documents (reports, publications), databases (tables, curves, graphics), and methods (schemes), for both industrial and academic sources. Most of the metadata gathered will be e-resources. The discipline in managing the metadata will follow the appropriate rules to ensure precision and completeness, increase its usage (re-use), avoid duplication of the efforts at the interinstitutional level except for planned interlaboratory tasks, and guarantee optimal recognition of the deliverable purposes.

The institutional repository (DTU Data) renders data findable, accessible, and citable for a minimum of 10 years. In addition, the depository (DTU Orbit) supports open-access versions of publications practicing (gold type preferred e.g., OpenAIRE, for which funds have been assured). Finally, research data management training and support will be provided and furtherly used by the consortium (WP7) aligned with the existing contextual in-house policies and standards:

- *DTU's Research Data Management Policy,*

and the EC guidelines considered e.g., by the *National strategi for data management baseret på FAIR-principper* (2021):

- Final Report and Action Plan from the European Commission Expert Group on FAIR Data. Turning FAIR into reality (2018),

and the mandatory EU regulations, pondering in this paragraph mainly:

- Commission Regulation (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata.



*Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?*

Yes. Firstly, a thematic workshop is under organisation by together the DTU and GCS for unifying the terminology used for the project's correspondence and affairs, with a distinction to addressing either formal and internationally recognizable standard nomenclature and other terminologies coming from the project's own settings (acronyms, keywords). A minimum of three keywords or tags will be required for each data item that will be generated and stored. Keywords for the K-hub itself are currently in preparation and will be provided for use together with the hub itself at the latest.

*Will metadata be offered in such a way that it can be harvested and indexed?*

Yes.

## 2.2 Making data accessible

*Repository:*

*Will the data be deposited in a trusted repository?*

Yes. As previously mentioned, the repository for the publishable data is a standard scientific database that abides by internal rules regarding providing open access. Then, the unpublishable data are stored at a hub platform available upon registration for a free membership. These selections made adhere to the consortium's ethical, legal, and contractual obligations. Moreover, for the research outputs generated sharing suitable open licenses reflecting those obligations are provided too.

*Have you explored appropriate arrangements with the identified repository where your data will be deposited?*

Yes. The data will be deposited at a created-on-purpose K-hub, and other popular platforms such as Zenodo developed under the European OpenAIRE program, as well as Open Data Portals and systems for dissemination facilities: DTU Orbit, DTU Data, RTWH datacentre, etc. These openly accessible systems facilitate immediate and longevity dissemination of scientific and non-scientific content. Deposited meta(data) will be hosted by DTU and GCS after the project concludes. Also, the K-hub will be hosted in AWS in a DTU repository. With guaranteed access provided by DTU, GCS will be able to perform limited maintenance of the platform occasionally, after project completion, for a defined period. There will also be a possibility to perform on-demand maintenance, if necessary.

*Does the repository ensure that the data is assigned an identifier? Will the repository resolve the identifier to a digital object?*

Yes. Repositories selected for this case (e.g., Zenodo) ensure by default real identifiers for all the publishable research outputs (articles, conference publications, briefs) to be provided with their unique digital ID (a persistent link) together with enabling citations and tracking of citation metrics. In addition, for unpublishable meta(data) the open data systems repositories (e.g., DTU Orbit and DTU Data, RWTH datacentre) are also provided with a digital object ID in all its potential forms (reports, newsletters, spot videos, newsletters, creative works, standards, or specifications), being these IDs their primary publication points. For example, data.dtu.dk item for the project has been already created and running on DTU Data platform.

*Data:*



*Will all data be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why, clearly separating legal and contractual reasons from intentional restrictions. Note that in multi-beneficiary projects it is also possible for specific beneficiaries to keep their data closed if opening their data goes against their legitimate interests or other constraints as per the Grant Agreement.*

No. Not all the data generated will be shared openly. The restrictions will be provided for the industrially sensitive or confidential metadata (e.g., patentable contents), for which the CA protects from the very start of the project (“Blades2Build Consortium Agreement, version 1.0, 2023-02-01”). Nevertheless, this approach will not consent to any potential lack of transparency regarding both academic and industrial partners in terms of the project’s duties and responsibilities.

*If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g., patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.*

The project possesses a strong presence of industrial partners, for which especially appropriate IPR protection will be considered under the CA. Nonetheless, the technical data will be shared in the first place to allow each partner to proceed with the respective, mutual, or more individual, tasks. In addition, to disseminate publicly the results in the form of publications to journals, conferences, events, etc. the consortium will convoke an IP board to manage especially all the exploitation intentions drafted regarding patents, trade agreements, and consultancy services.

*Will the data be accessible through a free and standardized access protocol?*

Partially. Some of the data will be accessible through gold open access, meantime others will be stored at a knowledge hub type of repository for every public use during the project and afterward. Some data is sensitive by nature and will not be made available.

*If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?*

If the data is sensitive, the reports will be stored in data.dtu.dk and will be internal to the consortium. Promotion will be given to the repository gathering the general public data to have the outcomes properly exploited in this sense too.

*How will the identity of the person accessing the data be ascertained?*

Regarding accessing the unpublishable data on the K-hub, it will be available upon free registration. The registration criteria will consider simple personal and professional data for statistical purposes and the internal functioning will be mostly like a social professional network. Both registration (to access existing content) and submission (to upload new content) requests will have to follow a well-defined guideline and will require agreeing with Blades2Build Knowledge Hub reference terms.

*Is there a need for a data access committee (e.g., to evaluate/approve access requests to personal/sensitive data)?*

No. The decision-making process regarding the evaluation of the mutual access to personal-sensitive data proceeds on a confrontational basis with the partners during the consortium meetings before even the meta(data) is available. Finally, although all the consortium and/or partners’ meetings are recorded as part of the minutes, these contents are not released as regulated under the CA.

*Metadata:*





*Will metadata be made openly available and licensed under a public domain dedication CC0, as per the Grant Agreement? If not, please clarify why. Will metadata contain information to enable the user to access the data?*

Yes. The metadata will be disseminated through the open file to not compromise interoperability with other systems.

*How long will the data remain available and findable? Will metadata be guaranteed to remain available after data is no longer available?*

Partially. The EC calls require the data and metadata storage held for 5 years after the end of the project. The post-storage after this period will be conditioned by the data type and will differ if meant to be shared among research and innovation communities (articles, conferences publications, patents) or collected at the K-hub (public domain). Each metadata output (a deliverable in this case) disposes of its dissemination level (SEN, PU) and will be treated accordingly. Any potential recategorization of any DoA level will be discussed in the progress. Data will also be uploaded to data.dtu.dk and made available for the equivalent 10-year timeline after the project's termination.

*Will documentation or reference about any software be needed to access or read the data be included? Will it be possible to include the relevant software (e.g., in open-source code)?*

Partially. Spaces like the selected research database (DTU Orbit, etc.) are public places managed by libraries and available to the general public. Therefore, no specific documentation or reference for accessing will be required. On the contrary, the K-hub will be available upon request, and a free membership user-friendly registration. Nevertheless, an agreement to the terms of reference and commitment to get to know and verify the included guidelines will be requested for accessing.

## 2.3 Making data interoperable

*What data and metadata vocabularies, standards, formats, or methodologies will you follow to make your data interoperable to allow data exchange and reuse within and across disciplines? Will you follow community-endorsed interoperability best practices? Which ones?*

Yes. The project will contrast all the technological, data and format, human, and institutional/organizational layers of the consortium's interoperability. The project will operate with open files and standard formats through common interfaces of the Internet, as well as existing platforms to ensure immediate, long-term, or uninterminated findability. All the structure data and metadata seek for models and schemas as well as codifying this data using means of standard classifications and vocabularies. Among the most essential ones, one may distinguish construction products' normative and standard terminology, engineering information resources management as for faceted and hierarchical structures, common and mutual vocabulary control, and thesaurus construction starting from the consortium's level and specifically for the digital unpublishable contents – all aiming conformity, comprehension, and universality of the resource use in construction systems.

*In case it is unavoidable that you use uncommon or generate project specific ontologies or vocabularies, will you provide mappings to more commonly used ontologies? Will you openly publish the generated ontologies or vocabularies to allow reusing, refining, or extending them?*

Partially. To highlight consistency in the description of data and metadata elements within a dataset, a suitable mapping of terminology will be provided at par for indexing, labelling, and categorizing the contents. A special emphasis will be put on sectorial and standard comparability.



Although the project follows vocabularies and classifications of the European characteristic of construction systems standardisation, any new workflow arrangements (e.g., on terminology) are treated all as feasible for a possible publication.

*Will your data include qualified references<sup>2</sup> to other data (e.g., other data from your project, or datasets from previous research)?*

Yes. The project is based on a consortium collaboration, where each partner provides the corresponding database (reused) that it considers essential for its feedback on this project at present. The consortium also elaborates an internal terminology workflow document file to correlate the referenced contents.

## 2.4 Increase data re-use

*How will you provide the documentation needed to validate data analysis and facilitate data re-use (e.g., readme files with information on methodology, codebooks, data cleaning, analyses, variable definitions, units of measurement, etc.)?*

Data sharing and re-use will be licensed under Creative Commons CC BY 4.0. Public deliverables (including datasets and LCA model files) and relevant metadata will be published in well-known suitable data repositories (such as Zenodo), to facilitate data reuse.

*Will your data be made freely available in the public domain to permit the widest re-use possible? Will your data be licensed using standard reuse licenses, in line with the obligations set out in the Grant Agreement?*

Yes. All the licensing issues for using or reusing data are covered by the CA's provisions. If data is sensitive, data is only made available internally to the consortium according to CA.

*Will the data produced in the project be useable by third parties, after the end of the project?*

Intentionally, partially yes. Unless not covered by confidentiality, the created-on-purpose K-hub will ensure the usefulness of the meta(data) of the project under a verifiable but free membership.

*Will the provenance of the data be thoroughly documented using the appropriate standards?*

Yes. The data provenance in the project is gathered including essential information about the entities/individuals and activities involved in its production to assure assessment of its quality, reliability, uniqueness, universality, and therefore usability. On the data relevance level, suitable labeling and indexing tools are in place, as mentioned previously.

*Describe all relevant data quality assurance processes.*

The best practices consisting of consortium's measure efforts, assessing relevance, accuracy, consistency, timelines, and compliance are assured along with the project's execution. The same principles are applied to aspects related to the allocation of resources, data security, and ethical aspects. To respond to the needs of the project on the fly, the consortium foresees releasing the additional research outputs also for this case, e.g., to express the data quality assurance process

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<sup>2</sup> A qualified reference is a cross-reference that explains its intent. For example, X is regulator of Y is a much more qualified reference than X is associated with Y, or X see also Y. The goal therefore is to create as many meaningful links as possible between (meta)data resources to enrich the contextual knowledge about the data. (Source: <https://www.go-fair.org/fair-principles/i3-metadata-include-qualified-references-metadata/>)



as a part of the in-house Quality Management System (QMS) reviewable each 6-months (Task T7.7. Data management plan, as described in the D7.4 Project Management Plan).

### 3 OTHER RESEARCH OUTPUTS

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*In addition to the management of data, beneficiaries should also consider and plan for the management of other research outputs that may be generated or re-used throughout their projects. Such outputs can be either digital (e.g., software, workflows, protocols, models, etc.) or physical (e.g., materials, antibodies, reagents, samples, etc.).*

In addition to the publishable and unpublishable content the consortium's partners manage the resultant digital

- software (knowledge hub-like construction being an own initiative and task to perform),
- dedicated test protocols and workflows (e.g., for interinstitutional modus operandi covering the materials characterization) based on state-of-the-art monitoring,

and physical

- new construction materials product lines release (recycled, repurposed, or reused).

*Beneficiaries should consider which of the questions pertaining of FAIR data above, can apply to the management of other research outputs, and should strive to provide sufficient detail on how their research outputs will be managed and shared, or made available for re-use, in line with the FAIR principles.*

The created-on-purpose software responds to licensing agreements under the consortium that regulate its findability and accessibility afterward.

### 4 ALLOCATION OF RESOURCES

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*What will the costs be for making data or other research outputs FAIR in your project (e.g., direct and indirect costs related to storage, archiving, re-use, security, etc.)?*

Regarding the publishable data (research outcomes, especially) the respective gold or green open access-related cost is allocated by each partner's specific needs. On the other hand, the DTU has a gold open access fee waiver on the Elsevier platform. Consequently, some of the partners foresee thereof in their financial requests to the corresponding budgets. Finally, the project performs the communication issues related to the outcomes through the WP6. The partner in charge of this activity (DTU, GCS) has covered and distributed the cost expenses related especially to the unpublishable data releases to the K-hub to be designed and started up.

*How will these be covered? Note that costs related to research data/output management are eligible as part of the Horizon Europe grant (if compliant with the Grant Agreement conditions)*

All the cost generated by the meta(data) management is allocated under the specific budget of the partners involved and the coordinator. Although the DTU as a coordinator has a vital role in reporting the budget expenses to the EC, all partners have declared initially their financial needs to the consortium.





### *Who will be responsible for data management in your project?*

The responsibility for data management lies in the consortium. The consortium has assigned a team responsible for data management, curation, storage, and quality assurance coordinated by DTU and involving one person from each partner (Task T7.7. Data management plan led by the DTU along with the project's duration, M36). The DMP record initially prepared by M6, as predicted in FAIR principles, is to be revised by year 3 of the project.

### *How will long-term preservation be ensured? Discuss the necessary resources to accomplish this (costs and potential value, who decides and how, what data will be kept, and for how long)?*

The generated and contrasted existing data (e.g., from the lowest TRL stages) will be kept for 5 years following the project's termination. The dataset files will be physically stored by the DTU means for 10 years. Finally, as the K-hub will be running on a DTU AWS account, the storage time will be correlated with what DTU by default estimates as a reasonable period (10-year time).

## 5 DATA SECURITY

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### *What provisions are or will be in place for data security (including data recovery as well as secure storage/archiving and transfer of sensitive data)?*

The data security in all the project's contexts goes strictly correlated with the classification of the data performed constantly. The in-house provisions of the coordinator foresee categorisation data according to technical, non-technical, sensitive, etc. Internal standard protocols for IT security apply.

### *Will the data be safely stored in trusted repositories for long-term preservation and curation?*

Yes.

## 6 ETHICS

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### *Are there, or could there be, any ethics or legal issues that can have an impact on data sharing? These can also be discussed in the context of the ethics review. If relevant, include references to ethics deliverables and the ethics chapter in the Description of the Action (DoA).*

The ethical approach to the accessibility of data/research outputs and the whole digital infrastructure available for the project stands reflected for the same purposes and obligations apart from those that are legal and contractual. Finally, no specific ethical statements have been generated for the DoA, governing developments of the project in this field of information/data management towards national and international standards and requirements of the Horizon Europe program.

### *Will informed consent for data sharing and long-term preservation be included in questionnaires dealing with personal data?*

Partially. The management of the personal data is regulated by the CA under Sections 3.7, 4.4, 8.4 and 10 so that any potential questionnaires performed within this project will be preceded by the proper consent-related information treated as confidential or sensitive by default.



For those requesting access to the K-hub, the terms of reference will provide precise indications of how personal data is treated. As a rule, personal data (mostly name, and email address) will not be shared, whereas usernames will be used within the platform. Therefore, communication users will manage their data within the platform.

## 7 OTHER ISSUES

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*Do you, or will you, make use of other national/funder/sectorial/departmental procedures for data management? If yes, which ones (please list and briefly describe them)?*

The coordinator applies the procedures related to data management according to the in-house politics regarding this issue gathered at *DTU's Research Data Management Policy*, as mentioned previously. Finally, the national politics and strategies published by the Danish Agency for Higher Education and Science in 2021 apply through implementing the EU laws and regulations, among the most essential:

- Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE), and its corresponding implementations.
- Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information.



## 8 REFERENCES

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Commission Regulation (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata (OJ L 328, 15.12.2009, p. 83) (<https://eur-lex.europa.eu/eli/reg/2008/1205/2008-12-24>).

Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (OJ L 172 26.6.2019, p. 56) (<https://eur-lex.europa.eu/eli/dir/2019/1024/oj>).

Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) (OJ L 170 25.6.2019, p. 115) (<https://eur-lex.europa.eu/eli/dir/2007/2/2019-06-26>).

DTU Data (<https://data.dtu.dk/>)

DTU Library (<https://www.bibliotek.dtu.dk/en>)

DTU Orbit (<https://orbit.dtu.dk/en/>)

DTU's Research Data Management Policy (<https://www.bibliotek.dtu.dk/en/publishing/research-data/policy>), 2023.

DTU's Open Science-map (<https://www.bibliotek.dtu.dk/openscience>)

European Standard EN ISO 14040:2006+A1:2020 Environmental management. Life cycle assessment. Principles and framework.

Final Report and Action Plan from the European Commission Expert Group on FAIR Data. Turning FAIR into reality. Directorate General for Research and Innovation. ISBN 978-92-79-96546-3 DOI: 10.2777/1524. © European Union, 2018.

National strategi for data management baseret på FAIR-principper. 27 oktober 2021, Danish e-infrastructure Cooperation (DeiC). DOI: 10.48715/fm9h-m78.

OpenAIRE (<https://www.openaire.eu/>).

RWTH Research Database (<http://publications.rwth-aachen.de/?ln=en>)

Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (OJ L 127, 23.5.2018, p. 2) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02016R0679-20160504>).

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